

## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 :

G07F 9/02, 17/16, 7/00

A1

(11) International Publication Number:

WO 95/04333

(43) International Publication Date:

9 February 1995 (09.02.95)

(21) International Application Number: PCT/EP94/02549

(22) International Filing Date: 1 August 1994 (01.08.94)

(30) Priority Data:

VI93A000134

2 August 1993 (02.08.93)

IT

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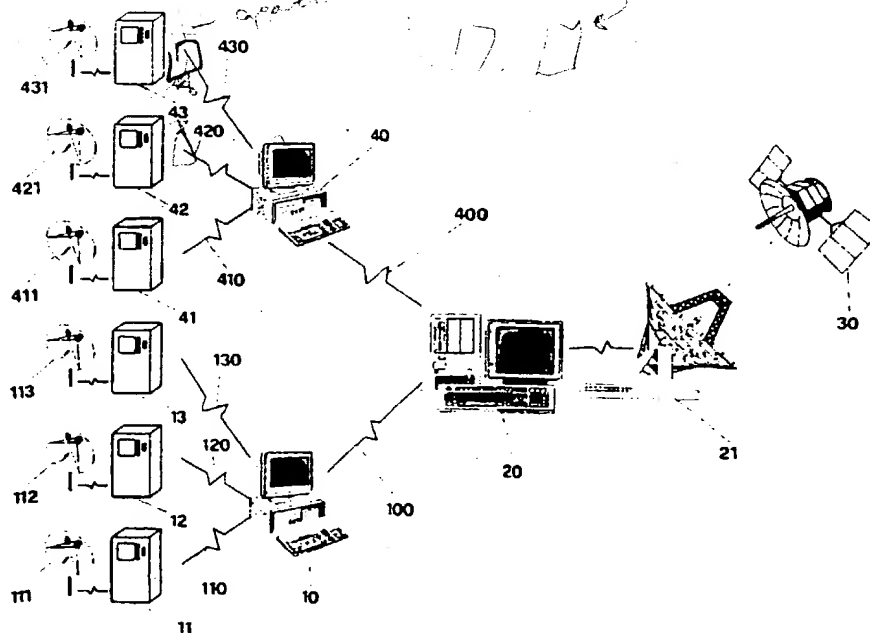
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(81) Designated States: AU, BR, CA, CN, CZ, FI, HU, JP, NO, PL, RO, RU, SI, SK, US, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

## Published

*With international search report.**Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.*

(54) Title: DISTRIBUTION NETWORK SYSTEM FOR PRODUCTS AND INFORMATION



## (57) Abstract

The invention is a distribution network system of automatic dispensers of products and information (11, 12, 13; 41, 42, 43) interconnected with one another and with at least a host computer (10, 40), where homogeneous groups of dispensers are suitable for exchanging information, by means of said host computer, with each dispenser connected with it and with the network node (20) that is connected with each host computer by means of telephone lines and is provided with a transceiver section suitable for getting through to each dispenser by radio, through an antenna (25) or a communication satellite (30).

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1 DISTRIBUTION NETWORK SYSTEM FOR PRODUCTS AND INFORMATION

2 The invention concerns a distribution network system of  
3 dispensers of products and services, more particularly a  
4 network of dispensers interconnected with each other  
5 through a telematic connection accomplished by means of a  
6 telephone or radio line and of a communication satellite  
7 system or by radio.

8 Automatic dispensers of products are known which are opera-  
9 ted by the user by means of coins or credit cards or elec-  
10 tronic cards.

11 One of the most widespread automatic dispenser is for  
12 distributing banknotes.

13 This machine is stocked with banknotes to be dispensed; the  
14 machine is provided with an electronic device that is able  
15 to read the magnetic card inserted by the user and to  
16 communicate with the master computer that checks the elec-  
17 tronic card inserted.

18 After checking, the machine enables the user to require a  
19 sum varying within a minimum and a maximum fixed in advan-  
20 ce. Once the user has chosen, a device counting the bankno-  
21 tes starts working and subsequently a dispenser conveys the  
22 selected amount of money to the outlet of the machine.

23 Other types of less complex machines are conceived so that  
24 by inserting an electronic card or coins a certain product  
25 can be selected. The product is chosen by means of a key-  
26 board and is then distributed through a special drawer. One  
27 of these machines is the coffee machine or the confectione-  
28 ry dispenser.

29 In the case of all these types of machines, if they don't  
30 have the required product available, they cannot comply  
31 with the user's request and neither can they inform the  
32 user about the nearest machine that can satisfy such a  
33 request.

34 The aim of the invention is to go beyond the limits of the  
35 automatic dispensers that have been described above.

1 One of the purposes to be achieved is the implementation of  
2 an interconnected distribution network of automatic dispen-  
3 sers, so that if the product the user wants to get from a  
4 certain dispenser isn't available there, the user can be  
5 informed about the location of the nearest automatic di-  
6 spenser where the required product is available.

7 Another aim to be achieved is the possibility of distribu-  
8 ting different products, even of different sizes and belon-  
9 ging to different marketing categories, by means of the  
10 automatic dispenser that is the object of the invention.

11 Another purpose to be achieved is to carry out an intercon-  
12 nection among automatic dispensers so that every automatic  
13 dispenser can inform the user about the possibility of  
14 finding the required products that are not available where  
15 they have been requested and can also give other kinds of  
16 information, both by asking the main storage of the compu-  
17 ter that controls the interconnected distribution network  
18 and by means of the linkage with Data Banks, a linkage that  
19 is accomplished on-line by the user and is payed for by  
20 directly debiting a credit card or by using a prepaid card.

21 Another aim to be achieved is to enable the manager of the  
22 interconnected network to bring up to date the stock of  
23 each product in each automatic dispenser on real-time and  
24 also to update the prices of the products, when necessary.

25 A further aim is to implement the automatic dispenser  
26 belonging to the network so that it can also take back the  
27 articles hired by the user, such as videocassettes, CD or  
28 other things, and at the same time carry out the necessary  
29 accounting operations like the cancellation of the item  
30 from the user's stock and the record in the stock of the  
31 dispenser.

32 All these aims and others that will be better explained  
33 later have been achieved by means of an interconnected  
34 distribution network system of automatic dispensers of  
35 products and information, which, according to the inven-

tion, is characterized in that it includes:

A) a plurality of automatic dispensers, each of which includes:

- organized spaces suitable for containing the products to be dispensed;
- means for taking a selected product and conveying it out of the store;
- a system for the positioning of said means;
- tools fixed to the conveying means, suitable for taking hold of the selected product and for releasing it;
- reading means for the identification of the selected product;
- primary storage systems for storing and processing the information regarding the stored items;
- secondary storage systems for managing the information received from the user or from the network with which the dispenser is connected;
- means for the identification of magnetic cards or semiconductor cards;
- means for dispensing the selected product to the user;
- means for connecting each dispenser with one or more dispensers of the network and each dispenser with a communication satellite by cable and/or by ether;
- means for displaying information;
- means for printing the required information, if necessary;

B) at least a host computer connecting a group of automatic dispensers, each of which is connected with a network node through telephone lines or by radio or by satellite; said computer being suitable for exchanging information with each dispenser that is connected with it and with the network node, said host computer being provided with its own storage and with means right for managing its own Data Banks;

C) a network node connected with each of said host computers by means of telephone lines or by radio and provided

1 with a transceiver section suitable for getting through to  
2 each dispenser by radio, through an antenna or a communica-  
3 tion satellite;

4 D) a communication satellite that receives data from the  
5 network node and is in connection with each dispenser.

6 According to the invention, each automatic dispenser is  
7 connected, preferably through telephone linkage, with a  
8 host computer that examines the requests coming from each  
9 dispenser when the latter is not able to comply with re-  
10 quests of products that are not available or when the user  
11 asks for information instead of products.

12 Once the host computer has received the piece of informa-  
13 tion from the automatic dispenser, it gets through to the  
14 network node by means of the telephone line and the network  
15 node transmits the whole information to a communication  
16 satellite. In turn the satellite transmits the information  
17 to each automatic dispenser of the network, which receives  
18 it by radio through a parabolic antenna. Once the informa-  
19 tion has been examined, the answer is released from the  
20 automatic dispensers the other way round, namely from the  
21 host computer connected with the dispensers to the node,  
22 then again to the satellite which transmits the information  
23 to the dispenser that has asked the question.

24 Owing to the interconnection among the individual dispen-  
25 sers and also to the fact that each dispenser can be con-  
26 nected with external networks by means of the communication  
27 satellite, it is obvious that each dispenser can work as a  
28 terminal for the on-line linkage with Data Banks.

29 Consequently, the user will be allowed to require informa-  
30 tion which will first be dealt with by the host computer  
31 and then transmitted by the node to a host computer exte-  
32 rior to the network through the satellite, a host computer  
33 that will be able to supply the required information, for  
34 example concerning market quotations, foreign currencies,  
35 etc.

1 According to the invention, each dispenser will also be  
2 able to take back the articles hired by the user, since it  
3 is conceived so that the means for dispensing and taking  
4 the products can operate even inversely, namely they can  
5 take up the object placed by the user in a given area,  
6 which can also be the dispensing area itself, and put the  
7 object in the store of the dispenser again, at the same  
8 time loading its electronic memory.

9 Further distinctive features and peculiarities of the  
10 invention in question will be better highlighted in the  
11 description of an application, chosen among many, of the  
12 network and of the method employed to accomplish it,  
13 illustrated in the attached table in a schematic way:

14 -Figure 1 shows the interconnection among the automatic  
15 dispensers of products and information and the interconnec-  
16 ting network;

17 -Figure 2 shows a variant of the interconnection among the  
18 dispensers belonging to the network.

19 Request for a product available in the dispenser.

20 With reference to Figure 1 the numbers 11, 12 and 13 repre-  
21 sent the automatic dispensers belonging to a first group,  
22 referred to as a whole with A, and connected by means of a  
23 telephone line, for example with protocol X28, with a host  
24 computer, referred to with 10, which is able to process the  
25 information transmitted by each of the automatic dispen-  
26 sers. Likewise, the automatic dispensers 41, 42 and 43 are  
27 connected by means of telephone lines, with protocol X28  
28 too, with a host computer 40.

29 Each of the automatic dispensers, which will not be descri-  
30 bed in detail since they are substantially made up follo-  
31 wing known technology, has in its inside one or more stores  
32 consisting in hive-shaped or organized spaces suitable for  
33 containing the products to be dispensed. Said spaces can be  
34 of different sizes or can be vary in such a way as to hold  
35 different products, like, for example, videocassettes, roll

1 films, compact-disks or others. Each automatic dispenser is  
2 provided with means for taking each product, which are  
3 operated by the choice of the user who, upon acceptance  
4 after inserting the identification card, can choose the  
5 products to select on a video screen.

6 The choice of the products can be made by the user in  
7 different ways, for example by means of a keyboard, of a  
8 joy-stick or of a touch-screen.

9 Once the computer inside the automatic dispenser has recei-  
10 ved the piece of information concerning the product to be  
11 taken, said computer compares it to that existing in its  
12 storage and transmits the order concerning the position in  
13 which the suitable mean has to be placed in order to take  
14 the selected product.

15 This way the mean for taking the product positions itself  
16 so as to face the compartment out of which the product has  
17 to be taken and by means of claspings items, such as pliers,  
18 the product is taken and subsequently conveyed to the  
19 outlet of the automatic dispenser. At this point the mean  
20 for identifying the selected product and the mean for  
21 reading such identification go into operation so as to  
22 report that a unit of a certain product has been taken and  
23 to cancel the presence of such a product from the store.

24 The operation ends when the product is conveyed into the  
25 distribution drawer of the automatic dispenser, upon debi-  
26 ting the operation to the user's account by credit card or  
27 upon the withdrawal of the same amount from a prepaid card.

28 The operation described above concerns the choice and the  
29 taking of a product chosen by the user and available in the  
30 automatic dispenser itself. This kind of operation cannot  
31 substantially be distinguished from other known operations.

32 The situation changes if the user asks for a product that  
33 is not available in the automatic dispenser where the  
34 request is made, or if the user asks for information in-  
35 stead of products. These two different cases will be dealt



1 with below.

2 Request for a product not available in the dispenser where  
3 the request is made.

4 If the user, who, for example, interacts on the automatic  
5 dispenser 11, asks for a product that is not available in  
6 said automatic dispenser, the storage and processing sy-  
7 stems present in the automatic dispenser 11 transfer the  
8 piece of information to the host computer, referred to with  
9 10, through the telephone line, referred to with 110, with  
10 protocol X28. The information is dealt with and transfer-  
11 red, through the telephone line 100 with protocol X25, from  
12 the host computer 10 to the network node 20. The means 21  
13 for transmission by radio pass the piece of information  
14 from the network node 20 to the satellite 30. The satellite  
15 30 passes the information on by transmitting it to all the  
16 paraboloids, both to those of the users' group A, namely  
17 111, 112, 113, and to the paraboloids relevant to the auto-  
18 matic dispensers of group B, namely to paraboloid 411 of  
19 dispenser 41, paraboloid 421 of dispenser 42 and paraboloid  
20 431 of dispenser 43.

21 If one or more automatic dispensers have the required  
22 product available, they transfer the information back to  
23 the host computer with which they are connected through a  
24 telephone line and from each of these computers to the  
25 satellite 30, which transmits the piece of information by  
26 ether to the dispenser 11, from which the request came.

27 The screen of the automatic dispenser 11 displays the  
28 information regarding the availability of the product: for  
29 example, it can indicate that the nearest dispenser in  
30 which the user can find the required product is in a cer-  
31 tain street of the same town or in the nearest town. If the  
32 user confirms the booking, the product is booked and the  
33 user can go to the dispenser, 12 for example, in order to  
34 take what has been reported to be available there.

35 Figure 2 shows a variant of the interConnection network

1 where the network node 20 is equipped with a radio antenna  
2 25 that transmits directly to the antennas 101, 102 and 103  
3 of the dispensers of the first group and to the antennas  
4 141, 142, 143 of the dispensers of the second group. This  
5 kind of connection is suitable for interconnecting dispen-  
6 sers scattered on a comparatively small geographical area.  
7 One of the obvious advantages ensuing from the interconnec-  
8 tion accomplished by means of a network of automatic di-  
9 spensers contrived according to the invention is the fact  
10 that, with particular reference to automatic dispensers  
11 located in different places in the same town, it is possi-  
12 ble to have a minimum quantity of goods in store and conse-  
13 quently to optimize the quantity of products available  
14 without increasing storage expenses. Furthermore, it is  
15 thus possible to comply with the user's request in the best  
16 way.

17 Request for information from the user.

18 The intercommunicating network of automatic dispensers that  
19 is the object of the present invention can be used to  
20 accomplish the distribution not only of products, but also  
21 of information.

22 For example, information regarding data could be available,  
23 held in the Data Banks belonging to host computers that are  
24 not part of the network.

25 In this case the request made, for example, by the automa-  
26 tic dispenser 12 through the telephone channel 120 reaches  
27 the host computer 10, which deals with the piece of infor-  
28 mation and transmits it to the network node 20 with proto-  
29 col X25 through line 100. The host computer 10 is provided  
30 with a modem, by means of which it can get in connection  
31 with the network node 20 through the telephone line 100;  
32 further, through said node it can connect itself with the  
33 Data Banks that are interconnected with the network node by  
34 means of the communication satellite 30 that communicates  
35 with the host computer and the modem.

1 This way from any automatic dispenser any kind of informa-  
2 tion can be required, both belonging to the internal Data  
3 Banks of the host computer 10 and to the external Data  
4 Banks that are connected by the host computer 10 by modem,  
5 as stated above.

6 Naturally, once the information has been delivered, the  
7 transaction ends and the user is charged with the service:  
8 the charging operation is displayed on the screen of the  
9 automatic dispenser 12 or is printed, if the dispenser is  
10 provided with a printer.

11 As it is clear from what has been described up to now, the  
12 interconnection that takes place by means of a network of  
13 automatic dispensers able to exchange information with one  
14 another, both within the same subgroup and with other  
15 subgroups through the network node and by radio, antenna or  
16 satellite, optimizes the distribution of the products and  
17 allows the managers of the network to know the whole situa-  
18 tion of each dispenser of the network at any moment and  
19 therefore to restock the dispensers with the products of  
20 which they are short, if necessary.

21 Moreover, the network system that is the object of the  
22 invention also allows to direct the user to the nearby  
23 dispensers, if the dispenser is short of the required  
24 product or it allows the user to book the item he is inte-  
25 rested in.

26 Besides, the information is an additional service distribu-  
27 ted by the network by means of the interconnection of the  
28 automatic dispensers with Data Banks that can be both  
29 inside or outside the system.

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## 1 CLAIMS

2 1) Distribution network system of automatic dispensers  
3 of products and information characterized in that it com-  
4 prises:  
5 A) a plurality of automatic dispensers (11, 12, 13; 41, 42,  
6 43), each of which includes:  
7 -organized spaces suitable for containing the products to  
8 be dispensed;  
9 -means for taking a selected product and conveying it out  
10 of the store;  
11 -a system for the positioning of said means;  
12 -tools fixed to the conveying means, suitable for taking  
13 hold of the selected product and for releasing it;  
14 -reading means for the identification of the selected  
15 product;  
16 -primary storage systems for storing and processing the  
17 information regarding the stored items;  
18 -secondary storage systems for managing the information  
19 received from the user or from the network with which the  
20 dispenser is connected;  
21 -means for the identification of magnetic cards or semicon-  
22 ductor cards;  
23 -means for connecting each dispenser (11, 12, 13; 41, 42,  
24 43) and a host computer (10, 40) by cable (110, 120, 130;  
25 410, 420, 430):  
26 -means for connecting each dispenser (11, 12, 13; 41, 42,  
27 43) and a host computer (10, 40) by ether (111, 112, 113;  
28 411, 421, 431)  
29 -means for displaying information;  
30 -means for printing the information required;  
31 B) at least a Host computer (10, 40) connecting a plurality  
32 (A, B) of automatic dispensers, each of which being connec-  
33 ted to a network node (20) by means of telephone (100,  
34 200), radio or satellite links, said computer being suita-  
35 ble for exchanging information with each of the dispensers

1 connected with it and with the network node, said host  
2 computer being provided with its own storage and with means  
3 suitable for managing its own Data Banks;

4 C) a network node (20) connected with each of said host  
5 computers (10; 20) by means of telephone lines (100; 200)  
6 and provided with a transceiver section suitable for get-  
7 ting through to each dispenser by radio.

8 2) Distribution network system according to claim 1,  
9 characterized in that the transceiver section of the net-  
10 work node is an antenna (25).

11 3) Distribution network system according to claim 1,  
12 characterized in that the transceiver section of the net-  
13 work node is a communication satellite (30) that receives  
14 information from the network node (20) and communicates  
15 with each of said dispensers (111, 112, 113; 411, 421,  
16 431).

17 4) Method for dispensing the products contained in the  
18 automatic dispensers belonging to the distribution network  
19 system according to claim 1) characterized in that it  
20 comprises the steps as follows:

21 -a step in which the dispenser checks if the user's card is  
22 enabled to take products;

23 -a step in which the products that can be selected are  
24 displayed on the video screen;

25 -a step in which the user chooses the product he wants;

26 -a step in which the dispenser checks if the product is  
27 available and, if so, takes it and delivers it to the user;

28 -a step in which the request is passed from the dispenser  
29 to the others connected with the network by means of the  
30 host computer through a communication satellite, if the  
31 required product is not available in the dispenser;

32 -a step in which the answer concerning the place where the  
33 required product is available is displayed and/or printed,  
34 said piece of information coming from the satellite (30)  
35 connected with the dispenser from which the request came;

1 -a step in which the cost of the product is debited, if the  
2 product has been delivered.

3 5) Method for distributing information services  
4 through the network according to claim 1) characterized in  
5 that it comprises the steps as follows:

6 -a step in which the dispenser checks if the user's card is  
7 enabled to receive information;

8 -a step in which the offered services are displayed on the  
9 screen;

10 -a step in which the user chooses the service he is intere-  
11 sted in;

12 -a step in which the dispenser is linked by cable to the  
13 host computer with which it is connected;

14 -a step in which the request is processed by the host  
15 computer and the storage files belonging to said computer  
16 are checked;

17 -a step in which the answers coming from the remote host  
18 are transmitted by cable from the host computer to the  
19 dispenser; said answers are distributed through the satel-  
20 lite (30) to the network node (20) and subsequently to the  
21 host computer (10) to which the dispenser that has made the  
22 question belongs;

23 -a step in which the required piece of information is  
24 displayed and printed.

25 6) Method for distributing information services accor-  
26 ding to claim 5, characterized in that it comprises a step  
27 in which Data Banks that belong to the host computer itself  
28 or are external to the network are connected by modem and  
29 by communication satellite.

30 7) Method for distributing information services accor-  
31 ding to claims 5 or 6, characterized in that it comprises a  
32 step in which the service is paid by charging the user's  
33 account with the relevant amount.

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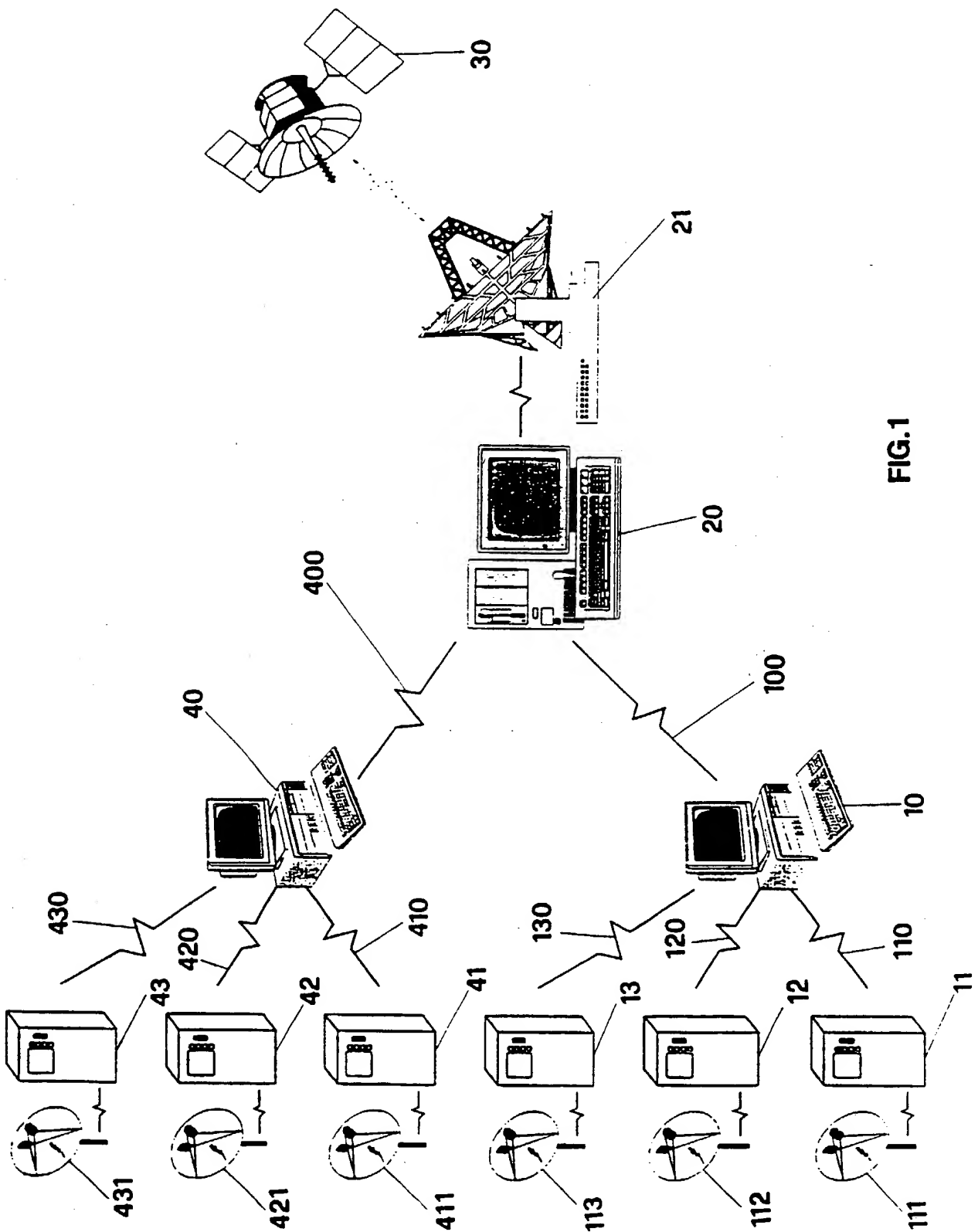


FIG.1

2/2

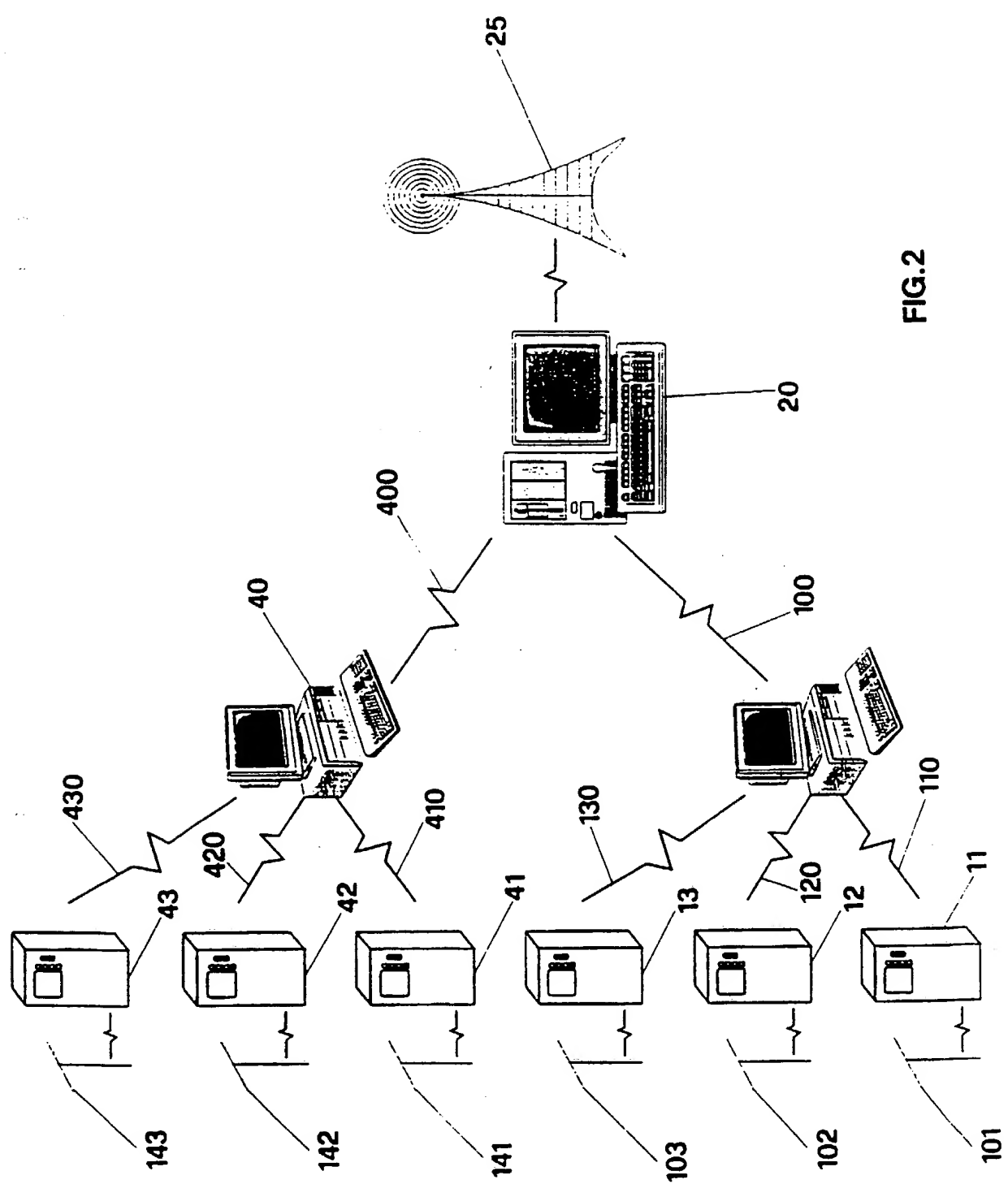


FIG.2



A. CLASSIFICATION OF SUBJECT MATTER  
 IPC 6 G07F9/02 G07F17/16 G07F7/00

According to International Patent Classification (IPC), or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
 IPC 6 G07F

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
|------------|--|-----------------------|
| Y          | US,A,4 896 024 (H. MORELLO) 23 January 1990<br>see abstract; figures 1,11-13<br>see column 4, line 55 - column 8, line 32<br>see column 12, line 47 - column 13, line 42<br>see column 18, line 21 - column 19, line 24<br>--- | 1,4                   |
| Y          | GB,A,2 110 450 (OMRON TATEISI ELECTRONICS) 15 June 1983<br>see abstract; claims; figures 1-8,12,16-19<br>---   | 1,4                   |
| A          | EP,A,0 537 756 (FUJITSU) 21 April 1993<br>see abstract; claims; figures 1-3<br>see column 1, line 50 - column 8, line 43<br>---<br>-/--  | 1-7                   |

☒ Further documents are listed in the continuation of box C.

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Date of the actual completion of the international search

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| A  | US,A,5 091 713 (A.H. HORNE) 25 February 1992<br>see abstract; claims; figures<br>see column 3, line 10 - column 4, line 20<br>--- | 1,4                   |
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